

March 13, 2012

Science Advisory Board Animal Feeding Operations Emission Review Panel

Mr. Edward Hanlon, Designated Federal Officer (DFO)

EPA Science Advisory Board Staff Office

(Sent via email: [Hanlon.Edward@epamail.epa.gov](mailto:Hanlon.Edward@epamail.epa.gov); [a-and-r-docket@epa.gov](mailto:a-and-r-docket@epa.gov))

**Brief comments on the “Development of EEMs for Lagoons and Basins at Swine and Dairy AFOs” report**

SAB AFO Emission Review Panel Members:

EPA’s conclusion about their attempt to develop EEMs for swine lagoons and dairy basins from the NAEMS data is as follows:

*“The EPA is considering additional analysis to develop the lagoon EEMs that produce emissions more consistent with expectations regarding relationships between the emissions and predictor variables.” (Page 5-69)*

The bottom line is that after 7 years, and nearly \$15 million dollars (not counting EPA’s expenditures) spent on monitoring and analysis, EPA has yet to develop swine and dairy EEMs. As disappointing and concerning as this is, it is not surprising. As the sampling design and monitoring protocols were being developed, many comments were sent to the EPA pointing out that there were not enough samples being collected across a wide enough array of conditions to produce a scientifically valid set of conclusions about emissions from various types of AFOs. EPA did not change the protocols based upon these comments and did not send the protocols out for blind peer review, a process long held by the scientific community as a standard practice.

On top of a poor sample and monitoring design, apparently there were many problems in conducting the monitoring plans that were put in place. The result is a data set that is skewed spatially, temporally and by animal type with insufficient data for many key parameters (e.g. [NH<sub>4</sub>], temperature and pH of lagoon.) Left with such a data set, it appears that EPA resorted to making a number of questionable assumptions in its analysis; chief among them the assumption that emissions from swine lagoons and dairy basins are similar enough to be lumped together. It is to EPA’s credit that they admitted to the failure of their analysis.

As EPA and the SAB deliberate on how to proceed, I offer the following thoughts: The approach used by EPA in developing the EEMs (based upon three parameters: animal type, farm size and lagoon surface area) is barely different from the model farm approach EPA used a decade ago. The model farm approach was deemed unsuitable for estimating emissions by the EPA-sanctioned NAS panel in their report on AFO air

emissions.<sup>1</sup> The NAS report concluded that what is needed is a simple process-based approach to estimate air emissions.<sup>2</sup> Available literature should be mined to find additional data to improve the analysis, with an emphasis on evaluating existing emissions modeling.

EPA needs to resolve the issue of how to determine which AFOs need air quality permits in a timely fashion. Years of additional delay with a continued moratorium on air quality regulation on AFOs is not an acceptable outcome.

Thank you for your consideration.

Joseph Rudek, Ph.D.  
Senior Scientist  
Environmental Defense  
4000 Westchase Avenue, Suite 510  
Raleigh, NC 27516

---

<sup>1</sup> Air Emissions from Animal Feeding Operations: Current Knowledge, Future Needs (2002)  
<http://dels.nas.edu/Report/Emissions-from-Animal-Feeding-Operations/10586>

<sup>2</sup> For an example of a simple process based model see Kanwardeep S. B., Aneja V.P., Arya, S.P., 2006, Measurement and estimation of ammonia emissions from lagoon-atmosphere interface using a coupled mass transfer and chemical reactions model, and an equilibrium model, Atmosphere Environment, 40:275-286